PRELIMINARY TECHNOLOGY ASSESSMENT

High Efficiency HVAC Rooftop Units



What is this Technology?

High efficiency heating, ventilating, and air conditioning (HVAC) units are a new class of rooftop unit (RTU) that can reduce building energy use by half without reducing HVAC effectiveness. Since rooftop units are often sized to supply enough heating and cooling for a worst-case scenario, they operate at a fraction of their full capacity much of the time. The high efficiency HVAC RTUs incorporate variable speed controls to minimize fan and compressor energy while capturing and reusing heat, cold, and humidity from a building's exhaust air.

Why is GSA Interested?

HVAC energy use represents roughly 35% of total energy consumed by GSA buildings. Replacing existing RTUs with the high efficiency RTUs could reduce HVAC energy consumption in GSA buildings by 50% or more.



ENERGY EFFICIENCY High efficiency HVAC RTUs have an integrated energy efficiency rating (IEER) of 18 or higher, with a 50%-60% reduction in energy use over current standards. They meet or exceed the required specifications as a certified respondent to the Department of Energy (DOE) RTU Challenge.



COST EFFECTIVENESS Calculations modeled for use of a high efficiency HVAC RTU in a one-story commercial building (approximately 105,000 ft²) show a savings of between \$10,000 and \$25,000 per year, when compared with a less efficient RTU. Manufacturer claims payback of 4.5 years. Returns vary with climate, with faster returns in hotter climates.



OPERATIONS & MAINTENANCE O&M for these RTUs would involve additional occasional cleaning of the heat and humidity recovery wheel, though it is not predicted to be significantly different from systems typically found in GSA buildings.



DEPLOYMENT POTENTIAL High efficiency HVAC RTUs have significant deployment potential. Rooftop units account for the vast majority of the commercial HVAC units installed in the United States. Their relatively short life cycle (10-20 years) creates increasing opportunities to replace existing units with high efficiency RTUs.

Adapted from a report by the National Renewable Energy Laboratory. The Green Proving Ground program, in association with a federal laboratory, is subjecting High Efficiency HVAC Rooftop Units to real-world measurement and verification in GSA buildings. Findings from that investigation will be available in late 2014 or early 2015.